

## Section 808. FENCING

**808.01 Description.** This work consists of furnishing and erecting or moving existing, woven wire fence, temporary fence, protective fence, chain link fence, high-tensile wire fence, and pedestrian fencing of structures.

**808.02 Materials.** Materials shall meet the following requirements.

Sound Earth .....	205
Concrete, Grade P2 .....	601
Fencing Materials .....	907
Structure Expansion Anchors and Bolts .....	914

- A. **Concrete.** The maximum allowable time interval between introduction of the mixing water and placement of the concrete in the work shall be one and one half hours. If additional time is required, a retarding admixture selected from the Qualified Products List may be used to delay the set time. The maximum time interval shall not exceed the manufacturer's recommendation for maximum initial time of set. Retempering is not allowed. No additional compensation will be allowed for admixtures.
- B. **Protective Fencing.** Material for temporary and protective fencing shall be new or used material in good condition. Preservative treatment of wood posts is not required.
- C. **Fence Fabric.** Fabric for chain link fence shall be either zinc-coated steel or aluminum-coated steel, or PVC coated if specified.
- D. **Moving and Salvaging Fence.** Salvaged material from temporary and protective fencing meeting the requirements of section 907, approved by the Engineer, may be used in the erection of permanent fence. All materials for moving fence which can be reused may be salvaged from the existing fence. All additional materials shall meet section 907 or shall conform to the materials and dimensions for the existing salvaged fence, if possible.

**808.03 Construction.** The finished fence shall be substantially true to line, taut, and solid at all points. The Engineer will designate and mark trees and other vegetation to be saved. Hand work may be required to construct the fence in these areas as well as in naturally occurring wet areas on the project at no adjustment in price for fencing. All surplus excavated material and other debris resulting from the construction shall be disposed of according to subsection 205.03.P.

- A. **Woven Wire Fence.** Wood posts shall be used in swamp and areas of unstable soil.

The Contractor may substitute wood posts for steel posts at no additional cost, if approved by the Engineer.

Where necessary to confine livestock, the permanent fence shall be erected before the existing fence is removed.

- 1. **Clearing Fence Line.** When existing fence is specified to be removed, line posts and anchors, trees, brush, stumps, logs, and other debris located on the fence line shall be removed as directed by the Engineer before starting fencing operations, and disposed of according to subsection 201.03.P. Where clearing for fence is specified on the plans, the fence line shall be cleared according to subsection 201.03.C.

2. **Setting Posts.** Posts shall be set to the depth shown on the plans. Minor variations in depth will be permitted to allow for alignment of post tops. Holes for wood posts shall be dug to full depth with a tolerance of plus or minus 3 inches. The exposed portion of the wood post shall not be less than 4.5 inches. Wood posts shall be set plumb on the side on which the wire is to be fastened. They shall be set with the large end down. The backfill around the post shall be sound earth thoroughly rammed in place. An approved post driver shall be used to drive steel line posts plumb. Bent or otherwise damaged posts shall be removed and replaced.

The tops of all posts shall be a uniform height above the ground. After the fence has been erected, the tops of wood posts shall be cut off to the proper elevation.

An intersection post shall be set in line with intersecting fences shown on the plans and braced in line with the intersecting fence. Both intersecting fences shall be connected to the intersection post.

3. **Anchoring and Bracing Wood Posts.** The end, corner, gate, angle, intersection, and intermediate braced posts shall be anchored as shown on Standard Plan R-101 Series. They shall be anchored in concrete as specified for steel posts or with wood cleats. The cleats shall be sawed lumber with durability equal to that of the posts.

Timber braces shall be securely spiked. A cable made of a double strand No. 9 galvanized wire shall be looped around the end, corner, gate, angle, intersection, or intermediate braced post near the ground line, and around the adjacent line post about 12 inches from the top and around the diagonal brace and twisted until the top of the adjacent line post is drawn back about 2 inches.

4. **Anchoring and Bracing Steel Posts.** The end, corner, gate, angle, intersection, or intermediate braced posts shall be anchored in concrete and braced as shown on Standard Plan R-101 Series. The end and gate posts shall be braced in the direction of strain with one brace. The corner, angle, and intermediate posts shall be braced in both directions. The intersection posts shall be braced in three directions. The braces shall be securely fastened to the post near the top. At all grade depressions and alignment angles where stresses are created that tend to pull the posts from the ground, the line posts shall be set in concrete as shown on the plans.
5. **Installing Fabric and Barbed Wire.** Each horizontal strand of wire shall be wrapped completely around the end, corner, gate or intermediate braced post and securely wound about the wire leading up to the post. The wire fabric shall be stretched taut and securely fastened to each post with the bottom of the fabric approximately 2 inches above ground. Line posts shall not be used as stretching anchorage, unless they are anchored as specified in subsection 808.03.A.4.

Splicing of wires in woven wire fabric and barbed wire shall be accomplished in a manner approved by the Engineer which will develop the full strength of the wire. The distance between the vertical wire stays adjacent to the splice shall be the same as for the unspliced sections of the woven wire fabric. Woven wire and barbed wire fence may be spliced only once at the end of a roll.

The fence fabric shall be securely fastened to each steel post with at least 6 wire clamps.

The fence shall be firmly attached to each wood post by at least one staple for each horizontal strand. Staples shall be made of 9-gage galvanized steel wire and shall not be less than 1½ inches in length for soft wood and not less than one inch for hard wood posts.

The barbed wire shall be securely fastened to each post 3 to 4 inches above the fabric.

- B. **Temporary Fence.** Temporary fence shall be erected as specified in subsection 808.03.A, with the following exceptions and additions.
  - 1. **Setting Posts.** Line posts shall be set a minimum of 2 feet, and end posts a minimum of 3 feet, into the ground and tops need not be trimmed. Intermediate braced posts may be omitted.
  - 2. **Installing Fabric.** The fabric shall be attached to wood posts by at least one staple for every third strand or to steel posts with a minimum of four wire clamps.
  - 3. **Removing Temporary Fence.** Unless otherwise specified, the temporary fence shall be removed and disposed of by the Contractor.
- C. **Protective Fence.** Protective Fence shall be placed around excavations for bridges, pumphouses, and other areas of the project where required for public safety according to subsection 104.10, called for on the plans, or directed by the Engineer. Protective fence shall be erected according to subsection 808.03.A with the following modifications.
  - 1. **Anchoring and Bracing Posts.** Anchor and brace enough posts to keep the fabric taut at all times.
  - 2. **Maintenance of Fence.** Maintain the protective fence until the Engineer directs its removal or the project is accepted.
  - 3. **Removing Protective Fence.** Remove and dispose of the protective fence.
- D. **Chain Link Fence.** Chain link fence shall be erected on steel posts set in concrete.
  - 1. **Clearing Fence Line.** Clearing and cleaning the fence line shall be according to subsection 808.03.A.1.
  - 2. **Setting Posts.** Posts shall be set in concrete and braced. Angle posts shall be installed where there is a deflection of 10 degrees or more in the alignment of the fence.  
  
An intersection post shall be set in line with intersecting fences. Both intersecting fences shall be connected to the intersection post. All posts shall be fitted with approved post caps.
  - 3. **Braces.** Braces shall be securely fastened to the end, corner, angle, intersection, gate and intermediate braced posts by means of suitable steel fasteners.
  - 4. **Installing Fabric and Top Tension Wire.** Chain link fence fabric shall be stretched taut and securely fastened to each post by means of approved fasteners spaced not more than 12 inches apart on the posts and not more than 15 inches apart on the tension wire. Fasteners fabricated from 12-gage galvanized wire shall be closed to the full crimp position around the tension wire and fabric.
- E. **High-Tensile Wire Fence.** High-tensile wire fence shall be according to subsection 808.03.A. The wires shall be erected according to the manufacturer's recommendations.

- F. **Fencing on Structures.** Fencing installed on structures shall be constructed according to subsection 808.03.D.

All exposed nuts shall be protected from vandalism by peening, scoring, upsetting the bolt threads, or other acceptable means.

Handrails, where shown on the plans as part of the structure fencing, shall be constructed according to section 707.

- G. **Moving Fence.** The existing fence shall be removed without damage to the materials. Materials which are damaged, or destroyed shall be replaced at the Contractor's expense. Posts and anchors shall be set in the same manner and at the same depth and spacing as in the original fence. If the fence consists of wire fabric it shall be drawn taut but care shall be taken to prevent overstressing the salvaged materials. The reset fence shall be placed in at least as good condition as the existing fence before it was moved.

#### 808.04 Measurement and Payment.

Contract Item (Pay Item)	Pay Unit
Fence, Temp	Foot
Fence, Protective	Foot
Fence, Woven Wire with Wood Post	Foot
Fence, Woven Wire with Steel Post	Foot
Barbed Wire	Foot
Fence Gate, __ foot, for Woven Wire	Each
Fence, Chain Link, __ inch	Foot
Fence, __ inch Chain Link, with (number) Strand of Barbed Wire	Foot
Fence Gate, __ foot, for __ inch Chain Link Fence	Each
Fence, High Tensile Wire	Foot
Structure, Fencing	Square Foot
Fence, Moving	Foot
Fence Post	Each
Fence Material	Foot

- A. **Fence.** Fence will be measured in place. Gate openings are not included in the measurements for **Fence, Temp**; **Fence, Woven Wire**; **Fence, Moving**; and **Fence, Chain Link**. Gates will be measured separately.

Payment for fencing includes furnishing and installing posts, braces, fabric and hardware.

Payment for fencing includes the cost of clearing the fence line; except in areas where **Clearing for Fence** is a pay item. **Clearing for Fence** will be measured and paid for according to subsection 201.04.

When **Barbed Wire** is required, it is measured and paid for separately, except when it is part of **Fence, \_\_ mm, Chain Link, with (number) Strand of Barbed Wire**.

- B. **Temporary and Protective Fence.**

1. Payment for **Fence, Protective** required according to subsection 104.10 will be considered as having been included in the contract unit prices for other contract items. When **Fence, Protective** is required by the Engineer or specified on the plans as a pay item, it will be measured and paid for as **Fence, Protective**.

2. The items **Fence, Temp** and **Fence, Protective** include furnishing, erecting, maintaining, removing, and disposing of the fence.
  3. Openings will not be deducted from measurements for **Fence, Protective** and the gates will not be measured separately.
- C. The item **Structure, Fencing** includes furnishing and installing posts, braces, fabric and all supporting, connecting and auxiliary elements required for erection on existing or new structures. This work includes furnishing and installing handrails when shown on the plans as part of the structure fencing.
- D. **Fence, Moving** will be measured in place in its new location. **Fence, Moving** will include moving the fence, installing it in its new location. New posts or new fence material, if specified on the plans or required by the Engineer, will be paid for at the contract or authorized unit price, which shall be payment for furnishing the posts or fence material.